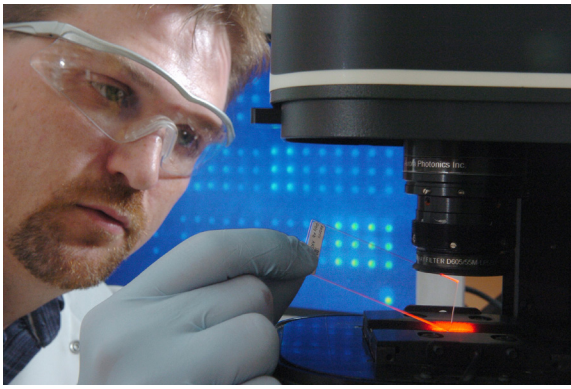
Proteomic Biochip Helps Identify Biomarkers of Cancer

Recent advances in the field of genomics have greatly accelerated research in human disease, but genetic sequencing and expression data is only the first step. Identification and characterization of the proteins expressed by a cell, known as proteomics, represent the true nature of biological systems.



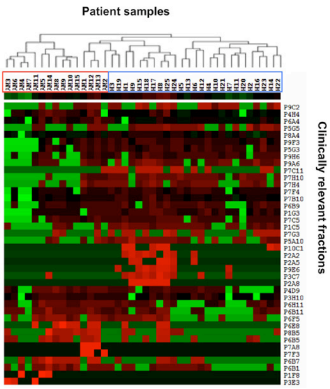
Biochemist Daniel Schabacker prepares to load a biochip onto a scanner.

The Challenge

An effective platform for discovering biomarkers of cancer would revolutionize clinical oncology. It could help enable early detection of cancer, and allow doctors to treat the disease in its early stages.

The Solution

Argonne scientists have developed a natural proteomic biochip for identifying biomarkers indicative of cancer. This new discovery tool combines liquid-phase protein fractionation, an emerging technology in the analysis of aberrant protein expression, with microarray technology to characterize cancerous tissues/fluids and serum derived from cancer patients.



Argonne's proteomic biochip was able to perfectly discriminate melanoma patient sera (red box at top of array pattern) from normal patient sera (blue box at top of array pattern). These results clearly indicate the diagnostic potential of this technology.

The Results

The Argonne-developed biochip has the potential to detect tumors sooner, resulting in more effective cancer treatment. Currently, Argonne researchers are working with industry partner Eprogen Inc. to develop this detection platform. At the Lab's Center for Nanoscale Materials, scientists will label identified biomarkers with nanoparticles creating probes for in vitro and in vivo imaging applications with cancer researchers at the University of Chicago. The team is also working with Loyola University scientists to apply the technology platform for biothreat agent (BTA) forensics.

***"Our technology provides high resolution characterization of cancer-related proteins in a simple-to-use and economical system enhancing high throughput biomarker discovery efforts,"* said Dan Schabacker, biochemist, Argonne National Laboratory.**